

PUIs: Visitor Guidelines, Evaluation and Testing in Neonates



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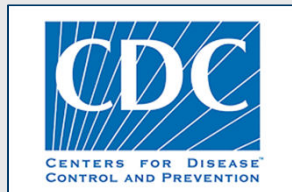
PUIs: Visitor Guidelines, Evaluation and Testing in Neonates

Objectives

1. Discuss COVID-19 illness in neonates
2. Discuss testing in neonates
3. Review recommended and practiced precautions
4. Discuss parent/visitor restrictions

COVID-19 in Neonates

“Transmission of SARS-CoV-2, the virus that causes COVID-19, to neonates is thought to occur primarily through respiratory droplets during the postnatal period when neonates are exposed to mothers, other caregivers, visitors, or healthcare personnel with COVID-19. Limited reports have raised concern of possible intrapartum or peripartum transmission, but the extent and clinical significance of vertical transmission by these routes is unclear.”



COVID-19 in Neonates

<p>Zeng L, Xia S, Yuan W, et al. Neonatal Early-Onset Infection With SARS-CoV-2 in 33 Neonates Born to Mothers With COVID-19 in Wuhan, China. JAMA Pediatr. March 26, 2020.</p>	<ul style="list-style-type: none"> • 33 neonates born to COVID + mothers in China • 3 infants tested positive • 1 born at 31 weeks with bacterial sepsis • 2 born at term with mild symptoms including shortness of breath, fever, lethargy, vomiting, PNA
<p>Zimmerman P, Curtis N. COVID-19 in Children, Pregnancy and Neonates: A Review of Epidemiologic and Clinical Features. The Pediatric Infectious Disease Journal: June 2020 - Volume 39 - Issue 6 - p 469-477.</p>	<ul style="list-style-type: none"> • 9 case series + 2 case reports described outcomes of COVID-19 in 65 mothers and 67 neonates in Australia • 30% fetal distress was reported • 37% of women delivered preterm • Neonatal complications included RDS/PNA (18%), DIC (3%), asphyxia (2%), 2 perinatal deaths. • 4 neonates (3 with PNA) have been reported to be SARS-CoV-2 positive despite strict infection control during delivery and separation of mother and neonates, meaning vertical transmission could not be excluded
<p>Jeng MJ. Coronavirus disease 2019 in children: Current status. J Chin Med Assoc. June 2020;83(6):527-533.</p>	<ul style="list-style-type: none"> • Early-onset (<7 days) neonatal COVID-19 was found in 3 neonates born to SARS-CoV-2–positive mothers; all were symptomatic, including fever, lethargy, respiratory distress, and pneumonia. Nasopharyngeal and anal swabs were positive on days 2 and 4 and negative on day 6 or 7 • Late-onset (≥7 days) neonatal COVID-19 was reported in 3 neonates between the ages of 15 and 19 days; infectious sources included their infected mothers (n = 2) and a housemaid. • Close contact with infected persons after birth is the most probable transmission route of these late-onset neonatal COVID-19 cases • All of these reported SARS-CoV-2–positive neonates recovered after management
<p>White A, Mukherjee P, Stremming J, et al. Neonates Hospitalized with Community-Acquired SARS-CoV-2 in a Colorado Neonatal Intensive Care Unit [published online ahead of print, 2020 Jun 4]. Neonatology. 2020;1-5.</p>	<ul style="list-style-type: none"> • 3 patients who required admission to the NICU in Colorado between the ages of 17 and 33 days old. • All 3 had ill contacts in the home or had been to the pediatrician and presented with mild to moderate symptoms including fever, rhinorrhea, and hypoxia, requiring supplemental oxygen during their hospital stay • 1 patient was admitted with neutropenia, and the other 2 patients became neutropenic during hospitalization • None of the patients had meningitis or multiorgan failure.

Evaluation & Testing of Neonatal PUIs

- Data to describing COVID-19 illness among neonates is limited; based on case reports and small case series
- We tend to think of the NICU population as immune compromised and at higher risk for severe illness
- Unclear whether signs of illness are due to COVID-19 or prematurity:
 - Fever, lethargy, rhinorrhea, cough, tachypnea, increased work of breathing, vomiting, diarrhea, and feeding intolerance/decreased intake



Evaluation & Testing of Neonatal PUIs

At Children's Minnesota:

- Infants whose mothers are COVID-19 + or are PUIs are also considered PUIs
- Infants who have a known exposure are also considered PUIs

CDC & AAP Recommendations for Testing of Neonatal PUIs

- **Testing is recommended** if testing capacity is available
 - Facilitates plans for care after hospital discharge
 - Determines the need for ongoing precautions
 - Contributes to our understanding of viral transmission and newborn illness
- Newborns should be bathed after birth to remove virus potentially present on skin surfaces
- Testing for SARS-CoV-2 RNA by reverse transcription polymerase chain reaction (RT-PCR) should be done first at ~24 hours of age and again at ~48 hours of age
 - Optimal timing remains unknown
 - For asymptomatic neonates expected to be discharged <48 hours of age, a single test can be performed
- For infants who are positive on their initial testing, consider follow-up testing at 48-72-hour intervals until two consecutive negative tests are obtained 24 hours apart to establish that the infant has cleared the virus
 - Most important for infants cared for in the NICU and less so for those discharged to home



May 28, 2020

SARS-CoV-2 (COVID-19) RT-PCR In-House Testing Options	
Option	Cepheid SARS-CoV-2 Assay
Platform	Cepheid, GeneXpert
Random access or Batch	Random access: 16 modules (Mpls); 8 modules (STP)
FDA Clearance Status	Emergency Use Authorization
Sensitivity/Specificity	<p><u>Percent Agreement (95% CI) – AccuPlex Reference Material</u></p> <p>Positive Percent Agreement (sensitivity) (n=20): 100% (83.9% - 100%)</p> <p>Negative Percent Agreement (specificity) (n=35): 100% (90.1% - 100%)</p> <p><u>Percent Agreement (95% CI) – Live Virus</u></p> <p>Positive Percent Agreement (sensitivity) (n=20): 100% (83.9% - 100%)</p> <p>Negative Percent Agreement (specificity) (n=30): 100% (88.7% - 100%)</p> <p><u>Percent Agreement (95% CI) – In House Test Verification Study, Children's MN</u></p> <p>Positive Percent Agreement (sensitivity) (n=50): 100% (92.89% - 100%)</p> <p>Negative Percent Agreement (specificity) (n=50): 100% (92.89% - 100%)</p>
Limit of Detection	<ul style="list-style-type: none"> • 250 copies/mL (AccuPlex Reference Material) • 0.0100 PFU/mL (Live Virus)
Daily Capacity	<p>Current Capacity: ~40/day</p> <p>Capacity dependent upon following factors:</p> <ul style="list-style-type: none"> • Availability of NP swabs and VTM • Test kit allocation by Cepheid (not guaranteed and subject to change)
Instrument run time	45 min
Test run times	24/7
Turnaround time	~60 minutes from receipt in laboratory
Go-live date	April 14, 2020

6/12/2020

34

Testing of Neonatal PUIs

At Children's Minnesota:

- Universal testing of all infants admitted through the ED; initiated on 5/13/2020
- Universal testing of all pregnant mothers prior to delivery; initiated on 5/21/2020

- For patients less than 1 month old:
 - 80 infants tested
 - 3 positive (3.8%)
 - 2 infants admitted through the ED; length of stay 2 days

Precautions

NICU Admission of PUIs:

- If infant is receiving aerosol-generating procedures place in **airborne**, contact, and eye protection precautions
- If infant is not receiving aerosol-generating procedures place in contact, droplet, and eye protection precautions

Visitor Restrictions/Precautions

At Children's Minnesota:

- Two healthy visitors at the bedside only (parents and support person) in the NICU
- Universal masking of all persons within the hospital
- Temperature screening of all healthcare providers and parents upon entering the NICU
- Universal use of masks and face shields with patient interactions for healthcare providers

PUI Visitation Guidelines

- Most NICUs have limited visitation at a baseline
- Mothers and partners who are COVID-19 PUIs should not enter the NICU until their status is resolved
- Mothers (and partners) with confirmed COVID-19 should not visit NICU infants while able to transmit virus
- CDC recommends two different approaches to help define when a person becomes non-infectious:
 1. **Symptom/time-based strategy**, mother can visit if (a) she has been afebrile for 72 hours without use of antipyretics with improving respiratory symptoms and (b) at least 10 days have passed since her symptoms first appeared (or, in the case of asymptomatic women identified only by obstetric screening tests, at least 10 days have passed since the positive test)
 2. **Test-based strategy** requires the mother to have negative results of a SARS-CoV-2 test from at least two consecutive specimens collected ≥ 24 hours apart

Poll Question

1. Can **asymptomatic** mothers with confirmed or suspected COVID-19 and well newborns room-in?
 - a. Always yes
 - b. Always no
 - c. It depends following a conversation with the mother

2. Can **symptomatic** mothers with confirmed or suspected COVID-19 and well newborns room-in?
 - a. Always yes
 - b. Always no
 - c. It depends following a conversation with the mother

Poll Responses

1. Can *asymptomatic* mothers with confirmed or suspected COVID-19 and well newborns room-in?
 - a. Always yes = **1**
 - b. Always no = **2**
 - c. It depends following a conversation with the mother = **15**

2. Can *symptomatic* mothers with confirmed or suspected COVID-19 and well newborns room-in?
 - a. Always yes = **2**
 - b. Always no = **1**
 - c. It depends following a conversation with the mother = **15**

COVID + Mother/Infant Dyad Separation PROS & CONS

PROS	CONS
<ul style="list-style-type: none">• May provide time for the mother to become less infectious and reduce transmission	<ul style="list-style-type: none">• Most newborns who are exposed to mothers who have COVID-19 do well• Reduces ability to promote mother/infant bonding and breast feeding during the critical days following birth• May be missing an opportunity to teach mother recommended hand/breast hygiene when caring for her infant

AAP & CDC Recommendations for Mother/Infant Dyad Rooming

- Controversial question; experts are divided on the best course of action
- Knowledge Gap: Risk to the infant in this situation is unknown at this time
- While difficult, the safest course of action from the perspective of minimizing the likelihood of the infant becoming infected is to separate mother and infant, at least temporarily
- Temporary separation may be accomplished by admitting the infant to an area separate from mother and separate from unaffected infants
- If after discussion with the clinical care team, the mother chooses to room-in, or if rooming-in is necessary, specific steps should be taken to minimize the risk of the newborn acquiring postnatal SARS-CoV-2 infection:
 - Mother should maintain a distance of at least 6 feet from her infant when possible
 - A non-infected caregiver should help provide hands-on care to the infant whenever possible
 - When the mother provides hands-on care, she should wear a mask and perform hand-hygiene
 - Use of an isolette may facilitate distancing and provide the infant an added measure of protection